

Stereotactic Radiosurgery for Recurrent Medulloblastoma in Pediatric and Adult patients: A Single-Institution Experience

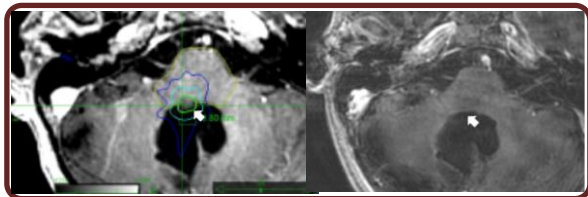
Kelly H. Yoo, MD, PhD¹, Neelan J. Marianayagam, MD, PhD¹, David J. Park, MD, PhD¹, Aroosa Zamarud, MD¹, Xuejun Gu, PhD², Quoc-Anh Ho, MD², Scott G. Soltys, MD², Steven D. Chang, MD¹

Department of ¹Neurosurgery and ²Radiation Oncology, Stanford University School of Medicine, Stanford, California, USA

Introduction

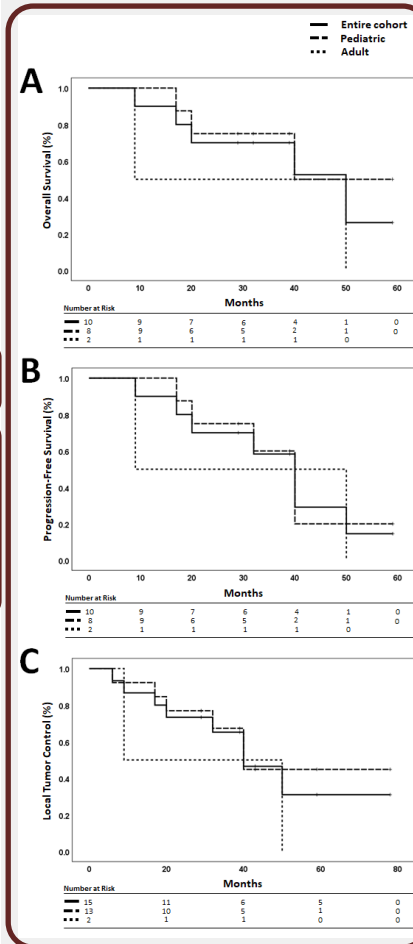
- **Medulloblastoma (MB)** is the most common malignant brain tumor in children.
- **Stereotactic radiosurgery (SRS)** is emerging as a promising modality for the treatment of **recurrent MB**.
- Our study aims to provide a comprehensive long-term analysis of the **efficacy** and **safety** of SRS for both **pediatric** and **adult** patients with recurrent MBs at a **single institution**.

Study Design



- **Retrospective analysis** of patients who underwent CyberKnife SRS for MBs between **1998 and 2023**.
- **8 pediatric** (ages 3-18) and **2 adult** patients (ages 19-75).
- Median tumor volume: **1.88 cc**.
- Single-fraction equivalent dose (SFED): **18 Gy**.
- Median isodose line: **75%**

Results



- Following a median follow-up of **39 months** (range: 6-78), **8 (53.3%)** of the MBs **progressed**, **2 (13.3%)** regressed, and **5 (33.3%)** remained **stable**.
- The **3-year local tumor control rate** for all MBs was **65.2%**, with **lower** rates observed in the **adult cohort (50%)** and **higher** rates in **pediatric patients (67.3%)**.
- The **3-year overall survival rate** was **70%**, with significantly **higher** rates in **pediatric patients (75%)** compared to **adult patients (50%)**.
- The **3-year progression-free survival rate** was **58.3%**, with **higher** rates in pediatric patients (60%) compared to adult patients (50%).
- **2 pediatric** patients developed **radiation-induced edema**, while **2 adult** patients experienced **radiation necrosis** at the latest follow-up, with both adult patients **passing away**.

Conclusion

- **SRS is a safe and effective long-term treatment option** for recurrent MBs in **both pediatric and adult patients**, resulting in **improved patient outcomes**.
- Although rare, radiation-induced edema and necrosis were observed as **adverse events** but were **manageable**.
- **Our findings provide optimistic evidence for the use of SRS as a viable treatment modality for MB.**